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ACCUMULATED SNOW DETECTOR OF SOLAR BATTERY AND AUTOMATIC SNOW-MELTING EQUIPMENT OF SOLAR BATTERY WHICH USES THIS

[太陽電池の積雪検出装置およびこれを用いた太陽電池の自動融雪装置]

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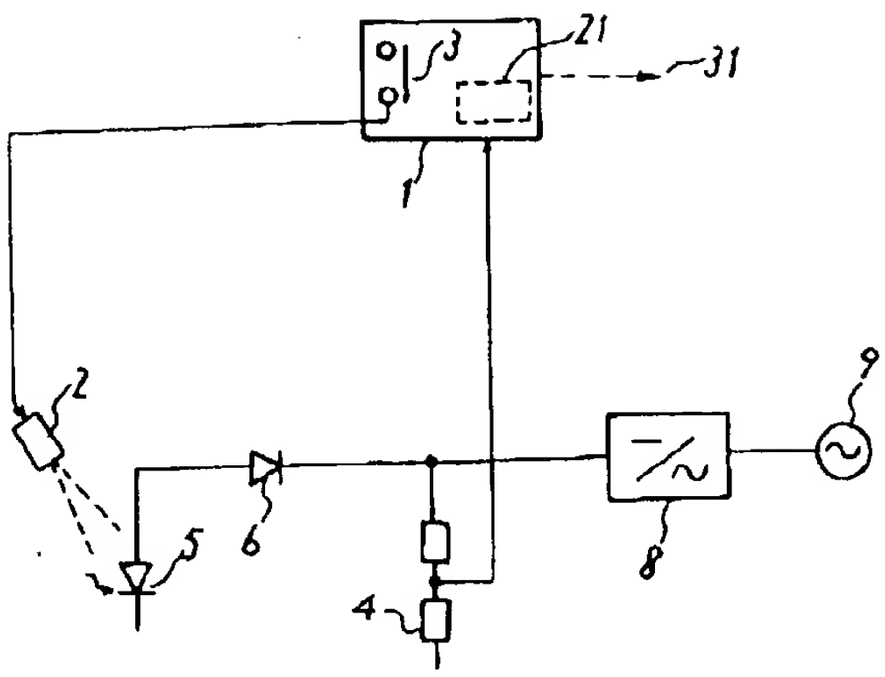
(57) [Abstract]
[Problems to be Solved by the Invention]
The conventional equipment which detects whether or not where snow is piled on the surface of solar battery could not be used at night when there is no solar light.
Because of that, snow-melting process could not be done at night and it was difficult to start generating electricity with sun rise.
[Means to Solve the Problems]
It provides strobe equipment 2 which irradiates light on the light-receiving surface of the solar battery 5, it detects voltage which solar battery 5 generates by the light of this strobe equipment 2 using the voltage detection mechanism 4, and by accumulated snow evaluation circuit 21 , this voltage is compared with specified value, and if it is high, it is evaluated as no accumulated snow , and it outputs detection signal 31.



1: 積雪検出ユニット
2: ストロボ発光装置
3: スイッチ
4: 分圧器
21: 積雪判定回路
31: 検出信号

[Claim(s)]

[Claim 1]

It is the accumulated snow detection equipment of solar battery with the characteristics wherein it is equipped with solar battery with light-receiving surface of solar battery to receive light of solar light; the strobe light emitting equipment which is installed so that the radiated light is irradiated on the light-receiving surface; Switch circuit which activates this strobe light emitting equipment; the voltage detection mechanism which detects output voltage of the aforementioned solar battery; accumulated snow evaluation circuit whereby when the light is emitted by the aforementioned strobe light emitting equipment, the presence or absence of the accumulated snow of the light receiving surface on the aforementioned solar battery is evaluated by comparing the output voltage of the aforementioned solar battery detected by the aforementioned voltage detection mechanism and the predetermined specified value, and then the accumulated snow detection signal is emitted.

[Claim 2]

The accumulated snow evaluation circuit of the solar battery has the characteristics wherein the accumulated snow evaluation circuit that was stated in claim 1 executes the comparison of the output voltage of the aforementioned solar battery between the constant time Ts after activating the aforementioned switch circuit and the predetermined specified value.

[Claim 3]

The accumulated snow evaluation circuit of the solar battery has the characteristics of being equipped with accumulated snow detection command circuit that operates the aforementioned switch circuit at an optional cycle while the output voltage of solar battery when the switch circuit stated in claim 2 is not operated is less then the predetermined value.

[Claim 4]
The accumulated snow evaluation circuit of the solar battery has the characteristics being equipped with accumulated snow detection command circuit which enables the switch circuit stated in claim 2 to b operated at the predetermined optional time.

[Claim 5]
The accumulated snow evaluation circuit of the solar battery stated in claim 3 has the characteristics wherein it is equipped with temperature detection circuit which detects the temperature near the solar battery and it transmits the accumulated snow detection command prohibition signal to the accumulated snow detection command circuit when it detects the temperature near the solar battery is more the specified value.

[Claim 6]
The accumulated snow evaluation circuit of the solar battery stated in claim 1 has the characteristics wherein strobe light radiating device is equipped with a storage box(es) that has a glass window(s) which houses a strobe(s), and the heater which heats the glass of the aforementioned glass window.

[Claim 7]
The accumulated snow evaluation circuit of the solar battery stated in claim 1 has the characteristics wherein the solar battery is a solar battery array that contains multiple solar batteries where some of the said solar battery have one strobe light emitting device respectively, and this solar battery array is equipped with one voltage detection mechanism, one snow accumulation evaluation circuit, and the timer circuit that sequentially operates the aforementioned several strobe light emitting devices.

[Claim 8]
The accumulated snow evaluation circuit of the solar battery stated in claim 2 has the characteristics wherein the constant time Ts which is stated in claim 2 is 5 ms~1000 ms.

[Claim 9]
The accumulated snow evaluation circuit of the solar battery has the characteristics wherein it is equipped with the accumulated snow detection equipment and the power source device which outputs voltage, and snow melting circuit that applies the voltage of the aforementioned power source equipment on the aforementioned solar battery for a constant time by the accumulated snow detection signal of the aforementioned accumulated snow detection equipment that are stated in claim 1.

[Description of the Invention]

[0001]

[Technological Field of Invention]
This invention relates to the equipment which detects that snow has accumulated on the surface of solar battery and also that automatically melts snow.

[0002]

[Prior Art]
There are the solar powered electricity generating systems which generates electricity by receiving sun light by the solar battery (photoelectric conversion vessel)
Since solar battery of solar powered electricity generating system is installed outdoors many times, at time of snowfall on the battery surface, which blocks light, and causes hindrance, hence, when there is some accumulated snow on surface, first, it is necessary to detect it by some method, if accumulated

snow is detected, next, it is necessary to remove accumulated snow by some method.

[0003]

Figure 7 is figure which shows voltage/current property of solar battery. As for solar battery when generating electricity, both voltage and current operate with characteristic of same positive characteristic line A, on this characteristic line, operating point is decided by load.

On one hand, when under the dark condition (At time of non- generating electricity) voltage application is done from outside, current flows in the reverse direction from when generating electricity; it operates as characteristic of same figure as characteristic line B, namely as load, at this time, the solar battery generates heat as applied voltage X current= electric power.

Namely, it has snow-melting function.

[0004]

For instance, Figure 8 is a configuration diagram of solar electricity generating system which possesses snow-melting function similar to what is shown in Japan Unexamined Patent Publication Hei 9-23019, it utilizes the aforementioned characteristic of solar battery in order to melt the accumulated snow on the solar battery surface.

In the figure, 5 is the solar battery□6 backflow prevention diode□7 generating electricity /snow-melting mode changeover switch□8 inverter□9 shows electrical system.

During the day time, and at the same time, when there is no accumulated snow and the solar battery 5 is generating electricity, the generating electricity /snow-melting mode cut-off switch 7(also called as switch) is set as "off" (condition which is shown in Figure 8), the direct current power which was generated by solar battery 5 is converted to alternating current by inverter 8 through backflow prevention diode 6, and is transmitted to the electrical system 9.

[0005]

20 is infrared light type snowfall sensor.

When infrared light type snowfall sensor 20 detects snowfall, or when a person recognizes accumulated snow on surface of solar battery 5, generating electricity /snow-melting mode cut-off switch 7 is turned on, inverter 8 is driven by charging mode (converter mode).

And electricity passes thru the route of electrical system 9→inverter 8→switch 7→solar battery 5, and the solar battery 5 operates with characteristic B of Figure 7, thus melting snow by heat emission.

Person verifies when snow melting is finished, and generating electricity /snow-melting switch 7 is reset.

Here, there is a case wherein in lieu of electrical system 9 and place of inverter 8, battery and direct current power supply equipment (Which not shown) are connected and electricity is passed to solar battery 5.

Example which uses battery is shown in for example Japan Unexamined Patent Publication Showa 6 2- 254635 disclosure.

[0006]

Since snow-melting method whereby this kind of solar battery 5 itself emits heat uses the solar battery 5 as a heater, if it is used when there is no snow accumulation or unless the switch 7 is not reset after snow fall is finished, electrical power is wasted.

rain water measuring vessel and snowfall sensor (not shown) is used in place of infrared light type snowfall sensor 20.

In addition, there is also a method which detects presence or absence of the

accumulated snow when generating electricity of solar battery by release voltage .

[0007]

[Problems to be Solved by the Invention]

accumulated snow detector of conventional solar battery is formed like above, but there were following type of problems.

1.although infrared light type snowfall sensor and rain water measuring vessel/ snowfall sensor can detects snowfall but does not directly detect the snowfall itself, when snow falls but there is no accumulation , there is a possibility of erroneous detection , in addition, it is not possible to detect the completion of snow-melting.

2. regarding the method which detects presence or absence of accumulated snow with release voltage of solar battery, it can be used only when sun shines or during daytime, hence, if snow is melt after detecting, there is a problem that generating electricity is missed using morning sun shine, and in case snow melting is finished during night, it can not be used to detect the snow melting completion.

[0008]

As for this invention, this was done in order to solve problems described above.

1) it can directly detect the accumulated snow on the light-receiving surface of solar battery,

2) Even during the night time when there is no sun shine it can be operated,

3) After snow-melting, this snow-melting completion can be detected even during night time.

The purpose is to provide the accumulated snow detector of solar battery which can utilize solar powered energy in the maximum limit by melting the show before sun rise.

[0009]

[Means to Solve the Problems]

the accumulated snow detection equipment of solar battery of this invention is equipped with solar battery with light-receiving surface of solar battery to receive light of solar light; the strobe light emitting equipment which is installed so that the radiated light is irradiated on the light-receiving surface; Switch circuit which activates this strobe light emitting equipment; the voltage detection mechanism which detects output voltage of the aforementioned solar battery; accumulated snow evaluation circuit whereby when the light is emitted by the aforementioned strobe light emitting equipment, the presence or absence of the accumulated snow on the light receiving surface of the aforementioned solar battery is evaluated by comparing the output voltage of the aforementioned solar battery detected by the aforementioned voltage detection mechanism and the predetermined specified value, and then the accumulated snow detection signal is emitted.

The strobe light emitting equipment and voltage detection mechanism can verify the size of electric generating capacity of solar battery, namely, the presence or absence of accumulated snow regardless of time and the climate.

[0010]

The accumulated snow evaluation circuit of accumulated snow detector of solar battery of this invention executes the comparison of the output voltage of the aforementioned solar battery between the constant time Ts immediately after activating the switch circuit and the predetermined specified value(s).

[0011]

In the accumulated snow detector of solar battery of this invention, it is equipped with accumulated snow detection command circuit that operates the aforementioned switch circuit at an optional cycle while the output voltage of solar battery, when the switch circuit is not operated, is less then the predetermined value.

[0012]

it is equipped with accumulated snow detection command circuit which operates the switch circuit at the predetermined optional time.

[0013]

it is equipped with temperature detection circuit wherein it detects the temperature near the solar battery and it transmits the accumulated snow detection command prohibition signal to the accumulated snow detection command circuit when it detects the temperature near the solar battery is more the specified value.

[0014]

The strobe light radiating device is equipped with a storage box(es) that has a glass window(s) which houses a strobe(s), and the heater which heats the glass of the aforementioned glass window, and the heater opening/closing circuit that turns off and on this heater power source.

[0015]

Regarding the accumulated snow evaluation circuit of the solar battery of this invention, the solar battery is a solar battery array that contains multiple solar batteries where some of the said solar battery have one strobe light emitting device respectively, and this solar battery array is equipped with one voltage detection mechanism, one snow accumulation evaluation circuit, and the timer circuit that sequentially operates the aforementioned several strobe light emitting devices.

[0016]

In addition, the aforementioned constant time Ts is 5 ms~1000 ms.

[0017]

It is the accumulated snow detection equipment of solar battery that is equipped with solar battery with light-receiving surface of solar battery to receive light of solar light; the strobe light emitting equipment which is installed so that the radiated light is irradiated on the light-receiving surface; Switch circuit which activates this strobe light emitting equipment; the voltage detection mechanism which detects output voltage of the aforementioned solar battery; accumulated snow evaluation circuit whereby when the light is emitted by the aforementioned strobe light emitting equipment, the presence or absence of the accumulated snow on the light receiving surface of the aforementioned solar battery is evaluated by comparing the output voltage of the aforementioned solar battery detected by the aforementioned voltage detection mechanism and the predetermined specified value, and then the accumulated snow detection signal is emitted; power source device that outputs voltage, and the snow melting circuit that applies the voltage of the aforementioned power source device on the aforementioned solar battery by the aforementioned snow accumulation detection device signal.

[0018]

[Embodied forms of the Invention]

Embodied form 1; the following accumulated snow detector of solar battery according to the embodied form 1 of this invention is explained by figures.

Figure 1 is a configuration diagram of accumulated snow detector of solar battery of this invention.

Regarding this figure, as for 1 is accumulated snow detecting unit□21 is accumulated snow evaluation circuit□3 is switch circuit□ 31 is an

accumulated snow detection signal.
During the day time, and at the same time, when there is no accumulated snow and the solar battery 5 is generating electricity, the direct current power which was generated by solar battery 5 is converted to alternating current by inverter 8 through backflow prevention diode 6, and is transmitted to the electrical system 9.
2 is the strobe light emitting equipment that is installed so that the light is irradiated on the light receiving surface of the solar battery 5; 3 is the switch circuit that enables the strobe light emitting equipment 2 to irradiate; 4 is a voltage division vessel (called voltage detection mechanism) which detects the voltage of solar battery 5.
As for 21 it is an accumulated snow evaluation circuit which compares the predetermined voltage with the voltage of voltage division vessel 4, and by its result, outputs accumulated snow detection signal 31
Furthermore, accumulated snow detecting unit 1 is formed by switch circuit 3 and accumulated snow evaluation circuit 21.
[0019]
Light of strobe light emitting equipment 2 is not as strong as solar light, but, subject to the irradiation of solar battery 5 during the sunless night, as shown in the test of fig 2, the voltage which designates 10% of solar battery release voltage figure as peak occurs for the several 10 milliseconds.
But, when there is some accumulated snow on the light-receiving surface of solar battery 5, since light of the strobe light emitting equipment 2 is blocked, and voltage is not generated, by comparing with the voltage (it is set to be the voltage that operates securely responding to the detection speed) a little lower than the peak voltage of the solar battery at the time of strobe light emission that was decided by measuring the output voltage of voltage division vessel 4 beforehand, it can detect presence or absence of the accumulated snow on the light-receiving surface of solar battery 5 voltage
The detection of accumulated snow switch 3 light emitting is done by operating switch 3 and activating the strobe light emitting equipment 2; regarding switch 3, it is preferable to execute automatically by timer that is not shown in the diagram, after sun set, or even during the day time, in case the output of solar battery 5 is low, at optional time (for instance, zero portion of odd number hour), or at suitable time interval (for instance, every 1 hour).
When accumulated snow is detected, accumulated snow evaluation circuit 21 outputs the accumulated snow detection signal (simply called detection signal) outputs 31.
[0020]
Figure 3 is figure of accumulated snow evaluation circuit 21 inside of the accumulated snow detecting unit 1.
As for 10 in Figure 3, it is a flip flop circuit and its output is detection signal 31.
11is detection starting signal and shows the output signal such as timer, but manually operated switch will do.
Timer 11 is accumulated snow detection command circuit.
12 shows pulse generation circuit which makes pulse signal in order to enable the strobe to emit light from the output by switch circuit 3.
13 is used to make signal D of specified time length, after detection start signal A from timer 11 by delay circuit.
As for 14, it is the comparison circuit and compares the electrical generating voltage of the solar voltage 5 from the voltage division vessel 4 and the predetermined value (Vr in the diagram) , if solar battery voltage is lower, signal E is outputted.

15 is a gate circuit and the output of comparison circuit 14 is passed only thru the signal D made by the delay circuit 13 and is sent to flip-flop circuit 10.

[0021]

Next is explained the operation.

The condition where solar battery 5 is not generating electricity by receiving sun shine, for example, night time or during the accumulated snow, timer 11 is turned on and signal A becomes L level by this.

By signal A, output of switch circuit 3 becomes H level, strobe light emitting signal is forwarded, strobe light emitting equipment 2 emits light.

On one hand, signal that corresponds to the detection time Ts is generated by signal B that reverses signal A and signal C that delayed signal A, gate 15 is opened by signal D only during H level.

If accumulated snow does not occur on the light-receiving surface of solar battery 5, the voltage which occurs due to strobe light is inputted into voltage division vessel 4 as pulse voltage Vs.

If this voltage Vs is lower in comparison with set voltage Vr, then the output E of comparator 14 stays L level and there is no change; if it is higher, output E of comparator 14 reverses to H level.

This signal passes thru gate 15, is inputted into flip-flop 10 and sets flip flop 15.

When voltage is generated by sun light, also voltage division vessel 4 also produces output, but unless timer 11 operates, since gate 15 is closed, flip-flop 10 will not be not set.

[0022]

During (it is preferable to use about Ts 5 - 1000 ms .) detection time Ts, if output E becomes H level, flip-flop 10 is set and it is decided that there is no accumulated snow and it is maintained till next time detection .

Furthermore, regarding the detection operation executed during night, as mentioned previously, by sun rise, before the time where solar battery starts generating electricity, at the time which anticipates required time leeway for snow-melting, it is good to execute once at least, either detection is executed at the built in time in the accumulated snow detection unit 1, or in case no built-in time exists, detection can be executed at the time interval set by the timer.

[0023]

In addition, during the day time, snow accumulation detection is done only when solar battery 5 is not generating electricity, the voltage of solar battery is always monitored by voltage monitor circuit not shown in the figure (well known), the specified value of electricity generating voltage, (for instance, in the cloudy weather, the condition 10% lower than the normal values) continues long, detection is started. .

In addition, since snow does not accumulate when external air temperature is high, by providing atmospheric temperature sensor (atmospheric temperature detection circuit) not shown here, if the atmospheric temperature is above a certain degree(for example 3 degrees C) the timer 11's circuit can be cut in order not to do snow accumulation detection, thus making it inoperable.

This is called accumulated snow detection command prohibition signal.

In addition, in order that strobe light emitting equipment 2 can irradiates on the receiving surface of solar batter 5, it is installed outdoors, it is housed in a storage box (not shown) so that it is not subjected to impact of rain fall and snow fall , and provides light-emitting surface of glass or other transparent on strobe light emitting side of this storage box.

And on this light emitting surface, heater is built in, and starting from a few hours before when snow accumulation detection is executed until finishing detection, it is fine if this heater can be turned on.

[0024]

The embodied form 2 in Figure 4 is a configuration diagram of automatic snow-melting equipment of solar battery using accumulated snow detector of Figure 1 for solar battery explained in the embodied form 1.

In the diagram 7 , using generating electricity /snow-melting mode changeover switch (simply called switch), it is controlled by accumulated snow detection signal 31 which is outputted by accumulated snow detecting unit 1.

When accumulated snow is detected, generating electricity /snow-melting mode switching switch 7 is turned on, inverter 8 is driven by charging mode (converter mode), electricity passes thru electrical system 9→inverter 8→switch 7→solar battery 5, or electricity is passed to solar battery 5 making use of direct current power supply equipment not shown in the diagram or battery, the heat is generated and snow is melted.

During snow-melting with suitable time interval (for example 0. 5 hours) snow-melting is discontinued temporally, accumulated snow is checked and wasteful electrical consumption is prevented, furthermore, if there is some accumulated snow, snow-melting operation is continued.

[0025]

starting of timer 11 can be done at a fixed time every day, however, in order to minimize the hindrance of electricity generation of solar battery 5 during the day time by accumulated snow, it is preferable that snow-melting operation is completed before morning comes

Therefore, it is preferable that detection of accumulated snow be done at the time going back the required time (It depends on also electric power capacity, but usually 2 or 3 hours for snow melting from the electricity generating time of solar battery in (It fluctuates by season .)

Sun rise time is widely known and throughout the year, the timer that can be set according to the seasonally changing time is known.

It is self-explanatory that accumulated snow detection start time is changed optionally depending on the presence or absence of solar power hindrance substance such as building in the vicinity where the solar battery is installed

Inverter 8 is the power supply equipment which outputs voltage which is described in this invention.

Generating electricity /snow-melting mode changeover switch is snow-melting circuit which is described in this invention.

[0026]

As for embodied form 3. solar battery is used, in most cases, not singly but as multiple pieces in a series or in parallel.

Because of this, arrangement of solar battery for this is called solar battery array.

In case of solar battery array, of course, it is not always necessary to provide accumulated snow detector for all solar battery.

In case of solar battery array, usually, they are installed as an incline, snow accumulates more in solar battery which is arranged in lower level in comparison with upper level .

In addition, it even changes by the wind direction, hence, snow does not accumulate evenly on all solar battery.

Because of this, regarding the strobe light emitting equipment 2 of embodied form 1 and switch circuit 3 which operates this, at the portion where it is likely to have much snow accumulation, multiple sets are installed per solar

battery array, thus executing snow accumulation detection.

[0027]

As for Figure 5, this is a case wherein solar battery 5a where strobe light emitting equipment 2a is installed, and solar battery 5b where strobe light emitting equipment 2b is installed have parallel connection , as for Figure 6, it has series connection similarly.

In either case, using the time interval longer than the detection time Ts that was explained in Embodied form 1, each switch circuit 3a, 3b are operated sequentially by timer circuit now shown in the figure, if detection is executed as in Fig 3, the detection of solar battery voltage can be executed by one of voltage division vessel 4 installed in the solar battery direct current bus, it is not necessary to install the accumulated snow evaluation circuit 21 of Figure 3 for every solar battery, but one circuit can be shared.

In addition, in case of configuration of Figure 5, the solar battery on/off switch 16a,16b is installed for each circuit of solar battery 5a,5b, only solar battery on/off switch of the circuit where accumulated snow is detected by sequential detection of the aforementioned respective circuit is thrown in, and electricity is passed only to the solar battery which has accumulated snow , thus melting the snow, then, snow-melting is more efficiently carried on.

[0028]

[Effects of the Invention]

As explained above, according to this invention, the following effect can be acquired.

1. Since accumulated snow itself on light-receiving surface of .solar battery is detected directly, the possibility of misdetection is small even at time of snowfall when there is not much accumulated snow.

In addition, completion of snow-melting can be detected.

[0029]

2. it can be used at night, in addition when snow-melting is completed at night, it can be used for detection of snow-melting completion.

[Brief Explanation of the Drawing(s)]

[Figure 1]

It is a configuration diagram of accumulated snow detector of solar battery of embodied form 1.

[Figure 2]

It is a explanatory diagram of generated voltage of solar battery by strobe light .

[Figure 3]

It is an accumulated snow evaluation circuit figure of accumulated snow detector of Figure 1.

[Figure 4]

It is a configuration diagram of automatic snow-melting equipment of solar battery according to embodied form 2 .

[Figure 5]

It is the accumulated snow detector of solar battery of embodied form 2, and it is a configuration diagram when it has parallel connection of solar battery.

[Figure 6]

It is the accumulated snow detector of solar battery of embodied form 2, and it is a configuration diagram when it is series connection of solar battery.

[Figure 7]

It is a general characteristic explanatory diagram of solar battery.

[Figure 8]
It is a conventional accumulated snow detector function and a configuration diagram of solar battery electricity generating system which possesses snow-melting function.

[Explanation of Symbols in Drawings]

1

accumulated snow detecting unit

11

Timer (accumulated snow detection command circuit)

2

strobe light emitting equipment

3

switch circuit

31

detection signal

4

voltage division vessel (voltage detection mechanism)

5

solar battery

7

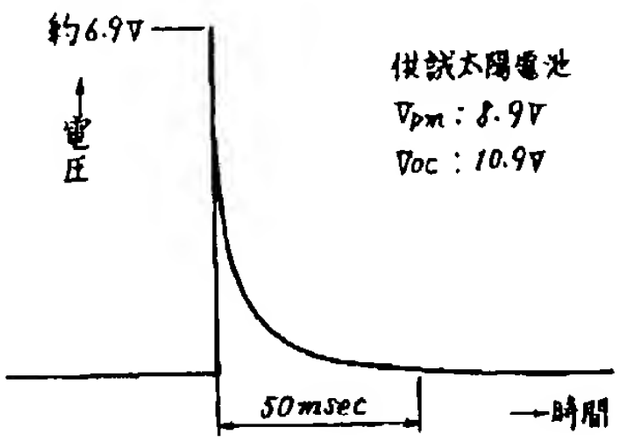
Generating electricity /snow-melting mode switching switch (snow-melting circuit)

8

inverter

Drawings

[Figure 2]



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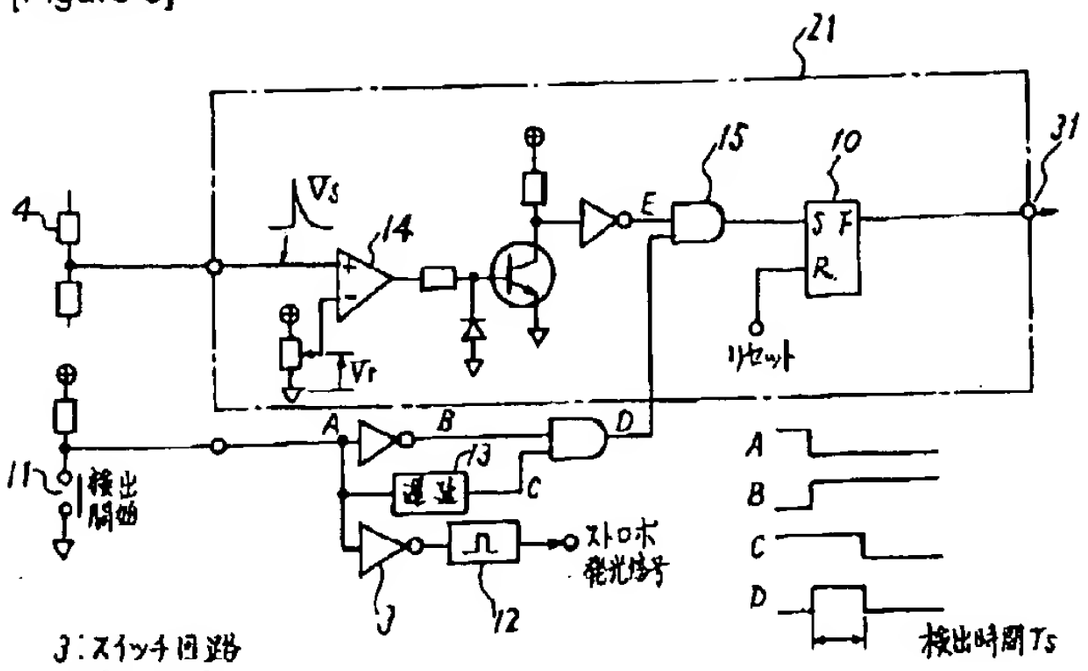
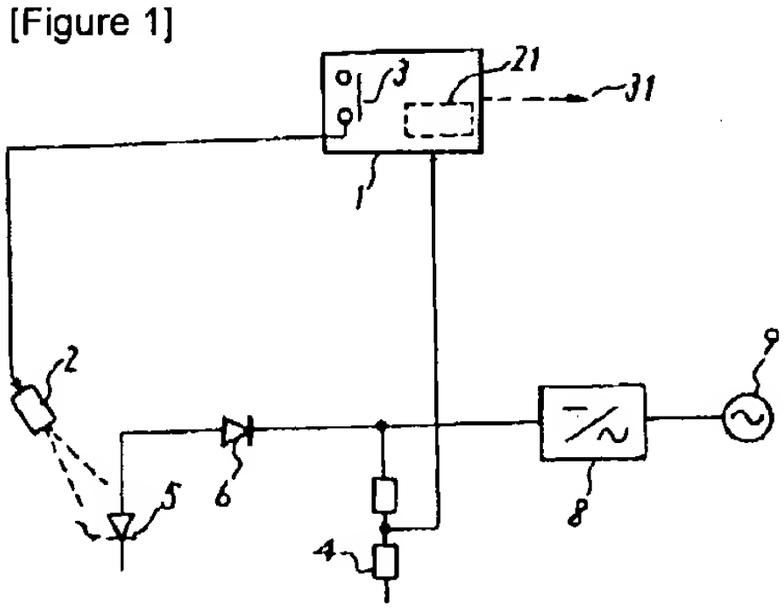


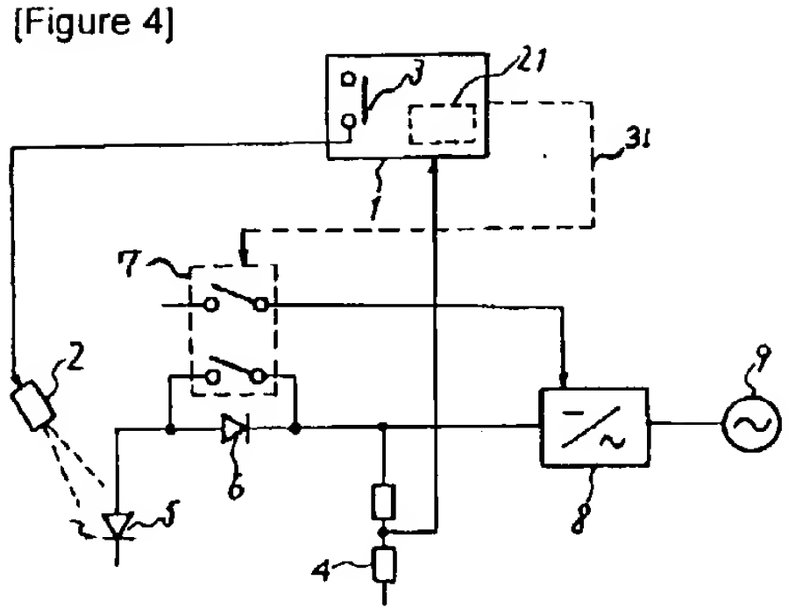
3：スイッチ回路
4：分圧回路
11：タイマ
21：積雪判定回路
31：検出信号

[Figure 1]



1：積雪検出ユニット
2：ストロボ発光装置
3：スイッチ
4：分圧器
21：積雪判定回路
31：検出信号

[Figure 4]



1：積雪検出ユニット

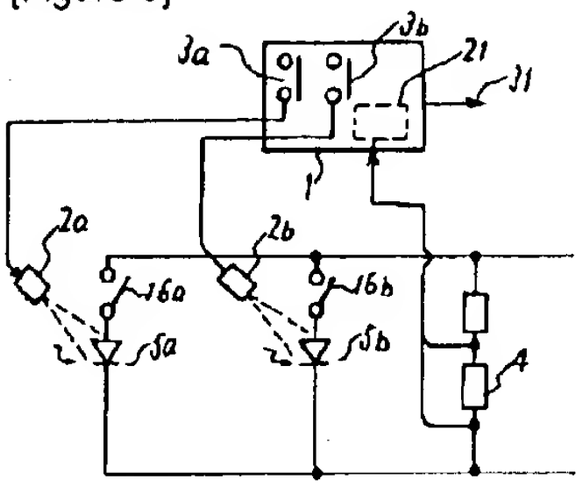
2：ストロボ発光装置

3：スイッチ

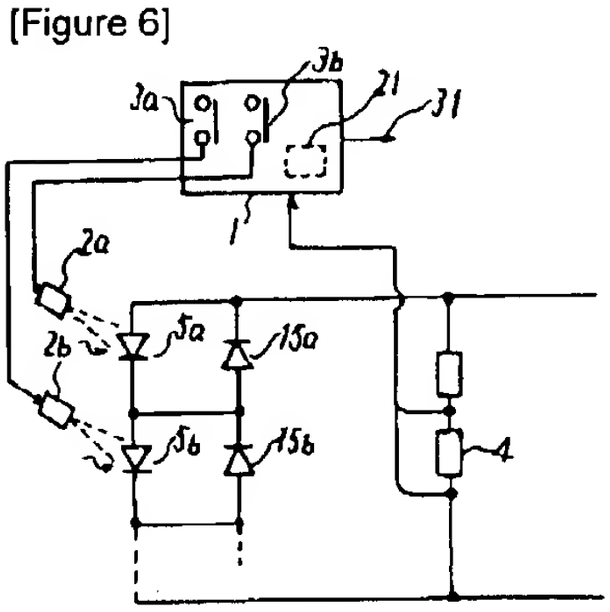
4：分圧器

21：積雪判定回路

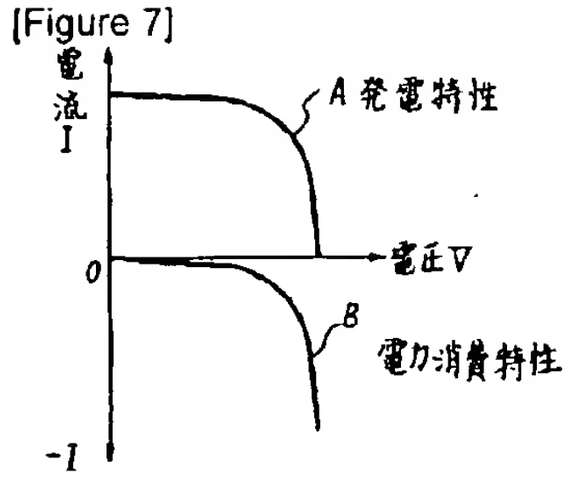
[Figure 5]



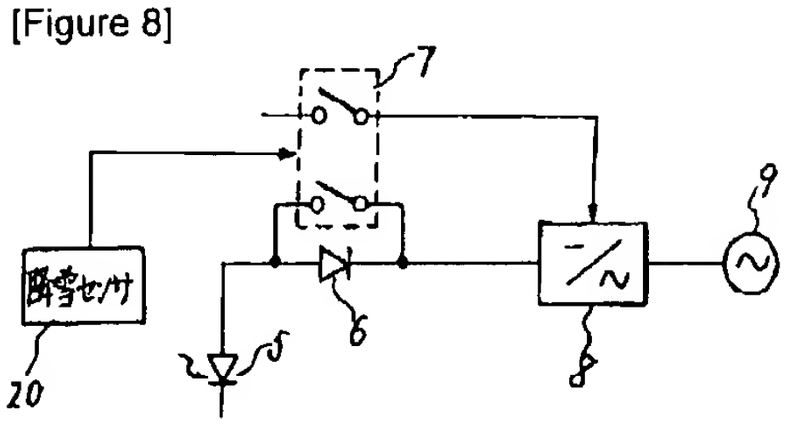
[Figure 6]



[Figure 7]



[Figure 8]



DERWENT-ACC-NO: 2000-166661
DERWENT-WEEK: 200015

TITLE: Snow coverage detector for solar battery - has decision unit that compares detected output voltage of solar battery with preset value to determine if snow is covering light receiving surface of solar battery

PATENT-ASSIGNEE: MITSUBISHI ELECTRIC CORP[MITQ]

PRIORITY-DATA: 1998JP-0187446 (July 2, 1998)

PATENT-FAMILY:

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JP 2000022192 A	January 21, 2000	N/A	006	H01L 031/042

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
JP2000022192A	N/A	1998JP-0187446	July 2, 1998

INT-CL (IPC): E04D013/18; H01L031/042

ABSTRACTED-PUB-NO: JP2000022192A
BASIC-ABSTRACT: NOVELTY - The solar battery (5) has a light receiving surface
that receives irradiated light from a stroboscope light emitting device (2) operated by a switch (3). The output voltage of the solar battery detected by a voltage divider (4) is compared with a preset value by a decision unit to determine if snow is covering the light receiving surface of the solar battery.
DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for an automatic
snow melting system of the solar battery.

USE - For solar battery.

ADVANTAGE - Can directly detect if light receiving surface of solar battery is covered with snow. Prevents incorrectly detecting that snow is covering light receiving surface. Completion of deicing is detectable. Can be used at night.
DESCRIPTION OF DRAWING(S) - The figure is the block diagram of the snow coverage detector. (2) Stroboscope light emitting device; (3) Switch; (4)

Voltage divider; (5) Solar battery.

CHOSEN-DRAWING: Dwg.1/8

TITLE-TERMS:
SNOW COVER DETECT SOLAR BATTERY DECIDE UNIT COMPARE DETECT OUTPUT VOLTAGE SOLAR BATTERY PRESET VALUE DETERMINE SNOW COVER LIGHT RECEIVE SURFACE SOLAR BATTERY

DERWENT-CLASS: Q45 U12

EPI-CODES: U12-A02A5;

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